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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/051,860  
Filing Date: January 16, 2002  
Appellant(s): BERGMAN, ERIC

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Kenneth H. Ohriner  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the amended appeal brief filed November 8, 2006 appealing from the Office action mailed July 28, 2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

This appeal involves claims 1, 5-10, 12-18 and 33-35.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,181,985    Lampert et al.    1-1993

5,868,866	Maekawa et al.	2-1999
5,927,306	Izumi et al.	7-1999
6,202,658	Fishkin et al.	3-2001
6,325,081	Miki et al.	12-2001
6,758,938	Torek et al.	7-2004
1-95522	Kobayashi (Japan)	4-1989

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 4-10, 12-18 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torek et al. (U. S. Pat. No. 6,758,938) in view of Japan 1-955222 (Japan'522), Izumi et al. (U. S. Pat. No. 5,927,306), Miki et al. (U. S. Pat. No. ,325,081) or Fishkin et al. (U. S. Pat. No. 6,202,658).

Re claim 1, Torek is cited disclosing an apparatus for processing a workpiece comprising:

a liquid supply source (pool 95);

one or more liquid outlets (75) disposed to apply a layer of liquid onto the workpiece (see col. 2, lines 46-57);

a liquid flow line (see fig 2) extending between the liquid supply source and the one or more liquid outlets for carrying liquid to the liquid outlets;

at least one heater (45) for heating the liquid before it is applied onto the workpiece;

an ozone gas supply system (as at 100) which provides ozone gas around the workpiece (see abstract) while the layer of heated liquid is on the workpiece that differs from the claim only in the recitation of the a sonic energy source associated with the liquid outlets for introducing sonic energy to the workpiece through the layer of liquid on the workpiece. Japan'522, Izumi, Fishkin and Miki are each cited disclosing that it is very old and well known to in the art of processing semiconductor workpieces, to have sonic energy associated with water-filled baths, supports and nozzle outlets for applying sonic energy waves for intensifying the cleaning or other processes. It therefore would have been obvious to one having ordinary skill in the art to modify the outlets of Torek, to include sonic energy associated therewith, for the purpose of enhancing the cleaning process. It has long been recognized in various arts that the application of sonic energy to a gas, liquid, supports or tanks, increases the effectiveness of the desired process. Miki for example teaches that suggests that by applying high frequency sound waves it is possible to "increase the washing effects" and to "shorten washing time" (see Miki col. 6, lines 64-67). Re claim 4, Torek, as proposedly modified, discloses the sonic energy source associated with the liquid outlets as claimed. Re claim 5, Izumi discloses the focusing chamber for the sonic energy. Re claim 6, to have the heater, heating the reservoir is deemed to be an obvious substitution of equivalents (see MPEP 2144.06 SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME PURPOSE. Re claim 7, Torek, Japan'522 and Miki disclose the liquid as claimed. Re claim 8, Torek, Izumi and Miki disclose the chamber. Re claim 9, Torek discloses the re-circulation as claimed. Re claim 10, Torek discloses the rotor (see fig. 5). Re claim 11, Torek, Japan'522, Fishkin,

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Izumi and Miki disclose the nozzles as claimed. Re claims 12-14, Torek discloses the controlling of the layer thickness (see col. 2, lines 46-57). Re claim 15, Torek discloses the controlling of the thickness as claimed (see col. 9, lines 9-11).

Re claim 16, Torek is cited as applied above disclosing an apparatus for treating the surface of a workpiece comprising:

- a liquid reservoir for holding a process liquid;

- a process chamber;

- a workpiece holder (85) within the process chamber;

- liquid spray nozzles (75) within the process chamber disposed to spray liquid onto the workpiece held by the workpiece holder;

- a liquid flow line extending between the liquid reservoir and the liquid spray nozzles;

- an ozone generator (see col. 6, lines 25-30) for generating a supply of ozone;

- one or more ozone supply lines (not shown) extending from the ozone generator to the process chamber;

- at least one heater for heating the process liquid,

that differs from the claim only in the recitation of the sonic energy source on the workpiece holder for introducing sonic energy to the workpiece. Japan'522 is cited disclosing that it is old and well known to provide a workpiece holder (see fig. 4) where there is provided a sonic energy source, for introducing sonic energy to the workpiece. It therefore would have been obvious to one having ordinary skill in the art to modify Torek, to include a sonic energy source as taught by Japan'522, for the reasons as

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previously stated in paragraph 2 above. Re claim 19, Japan'522, Fishkin, Izumi and Miki all disclose the horizontal orientation of the workpiece as claimed. It therefore would have been obvious to one having ordinary skill in the art to modify the orientation of the workpiece in Torek, to have and horizontal orientation as taught by Fishkin, Izumi and Miki, since Torek discloses that a "wide variety of rotating mechanisms could be used" (col. 8, lines 61-67). Re claim 18, Torek discloses the spent fluid valve (65).

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lampert et al. (U. S. Pat. No. 5,181,985) in view of Maekawa et al. (U. S. Pat. No. 5,868,866).

Re claim 35, Lampert is cited disclosing chamber;

apparatus comprising:

a chamber (col. 3, line 62-63);

a rotor in the chamber for holding and rotating a workpiece (col. 6, line 8);

a liquid supply source (col. 2, line 33);

a liquid outlet positioned to apply a liquid onto a workpiece in the chamber;

a liquid flow line connecting the liquid supply source to the liquid outlet (col. 2, lines 40-51);

a heater for heating the liquid (col. 2, lines 33-39);

an ozone gas generator (col. 5, lines 55-57);

an ozone gas supply line connecting the ozone gas generator to the chamber (col. 5, lines 47-53) that differs from the claim only in the recitation of the sonic energy source associated with the liquid outlet, and positioned adjacent to the

workpiece for introducing sonic energy to the workpiece, with the sonic energy conducted to the surface of the workpiece through liquid flowing out of the liquid outlet. The patent to Maekawa is cited disclosing the sonic energy source as claimed. It therefore would have been obvious to one having ordinary skill in the art to modify the device of Lampert, to employ sonic energy as taught by Maekawa, for the purpose of enhancing the cleaning effect as is old and well know in the art.

#### **(10) Response to Argument**

Applicant primarily argues that the application of the liquid in Torek, is in the form of a spray and therefore, not applicable with the respective teachings of Izumi, Fishkin, Miki or Japan'522/Kobayashi, since as argued to be well known, that sonic energy cannot travel through a spray, be cause a spray is not an incompressible fluid, i.e., it is not solid or a continuous liquid. It should be noted that while Torek discloses a spray, it is the examiner position that it would have been obvious to one having ordinary skill in the art to have the spray in Torek associated with sonic energy as taught by Izumi, Fishkin, Miki of Japan'522/Kobayashi, since Izumi (at col. 7, lines 32-52 and col. 3, lines 49-58), Fishkin (at col. Col. 1, lines 21-32), Miki (at col. 19, lines 31-45) and Japan'522/Kobayashi (see fig. 4) all disclose the spraying of the liquids and fluids. It should be noted that the examiner has used the Applicant's specification to specifically define the application of the liquid of Applicant's invention where Applicant has also define the sonic liquid application as "sprayed" as at paragraph [0006], line 5 "controlled spray"; at paragraph [0021], lines 4-5 "flows or sprays out through the nozzle" and in



claims 16, lines 4-7. Also noted that Applicant argues a “fluid link” between the nozzle and the wafer, but no specific limitation has been claimed.


As for the argument that Fishkin fails to disclose the claimed fluid layer, please note the Fishkin was only cited to disclose the obvious of employing sonic energy to a spray nozzle for enhanced cleaning as is common in the art. Torek discloses the layer as claimed (see abstract). As for Miki not disclosing the use of ozone, this teaching may be found in the disclosure of Torek. Miki was only cited to disclose the application of sonic energy to a spray nozzle as noted above. As for the argument in that any ozone in Mike would be separated by the sonic energy, please note that this is deemed immaterial in that in the disclosure in Torek, discloses two methods of providing ozone (see abstract) where the ozone may be applied either mixed with the fluid spray prior to spraying or unmixed but provides an “ozone-rich environment” and the workpiece is then sprayed (abstract). The individual use of ozone and sonic energy to treat semiconductor wafer are both old and well known. It is the examiner's position, that given the respective teachings of Torek, and either Izumi, Fishkin, Miki or Japan'522, especially where Torek teaches the use of ozone either mixed with the liquid prior to spraying, or not mixed with the water spray, it would have been obvious to modify Torek to employ sonic energy an enhanced cleaning effect as is old and well known in the art. As for the argument that Lampert fails to disclose the incompressible media as claimed, note the use of either an “aerosolized” medium and or the medium being “sprayed” (col. 2, lines 40-46) and again, as defined in Applicant's specification as noted above, the medium is sprayed as well.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

  
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GROUP ART UNIT 1746

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